Bialystok University of Technology									
Field of study	**Computer Science**							**Degree level and programme type**	**Engineer's degree full-time programme**
Specialization/ diploma path	**---**							**Study profile**	academic
Course name	**Geographic Information System**							**Course code**	**FCS-00085**
								Course type	obligatory
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	**Semester**	3
	30				30			**No. of ECTS credits**	**6**
Entry requirements	Linear Algebra (FCS-00030), Calculus (FCS-00002), Computer Graphics (FCS-00005), Programming Basics (FCS-00031), Data Visualization and Communication (FCS-00092),								
Course objectives	Familiarise student with techniques of geographic information systems								
Course content	Lectures: 1. Basic data models used in GIS techniques. 2. Definitions of the coordinate systems 3. Algebra of the map. 4. Representation of the map. 5. Pathing algorithms. 6. Representation of GIS data. Classes: 1. Implement application that consumes GIS API 2. Calculation of paths in map (e.g. using A* algorithm). 3. Representation of GIS data.								
Teaching methods	lecture problem, programming, simulation,								
Assessment method	Lecture - oral exam Laboratory - exercise reports								

Symbol of learning outcome	**Learning outcomes**	**Reference to the learning outcomes for the field of study**
LO1	knows the methods of GIS techniques. Knows the elementary methods of data acquisition and map representation structures	K_W10 K_W11
LO2	can design, program and deploy GIS application and algorithms	K_W03 K_W10 K_U11
LO3	by creating GIS applications student draws attention to the non-technical aspects: ergonomics, aesthetics, comfort, etc.	K_U13 K_U14 K_K04
LO4	is able to present the results of experiments in graphic form	K_U10

Symbol of learning outcome	**Methods of assessing the learning outcomes**	**Type of tuition during which the outcome is assessed**
LO1	Oral exam	L
LO2	Projects	Sw
LO3	Projects	Sw
LO4	Projects	Sw

Student workload (in hours)	**No. of hours**
1 - Attendance at lectures -	30
2 - Attendance at laboratories -	30
3 - Preparation for laboratories -	10
4 - Homeworks -	30
5 - Participation in student-teacher sessions -	10
6 - Preparation of reports -	25
7 - Preparation for the exam -	15
TOTAL:	**150**

Quantitative indicators	**HOURS**	**No. of ECTS credits**
Student workload – activities that require direct teacher participation	70 (1)+(2)+(5)	2.8
Student workload – practical activities	95 (2)+(3)+(4)+(6)	3.8

Basic references	1. Dawsen, Christopher J. Geographic Information Systems. Nova, 2011. Web. 2. DeMers, Michael N. Fundamentals of Geographic Information Systems. New York: Wiley J., 1997. Print.
Supplementary references	1. Ragia, Lemonia, Robert Laurini, and Jorge Gustavo Rocha. Geographical Information Systems Theory, Applications and Management. Vol. 936. Cham: Springer International AG, 2018. Communications in Computer and Information Science. Web
Organisational unit conducting the course	Department of Digital Media and Computer Graphics — **Date of issuing the programme**
Author of the programme	dr inż. Marcin Skoczylas — Feb. 18, 2022

L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW – field work,S – seminar